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Proceedings of the Academy of Natural Sciences of Philadelphia, 1879, pp. 137-152. From the society.

On the Old Red Sandstone of Western Europe. By Archibald Geikie, LL.D., F.R.S., etc. Part I, 4to, pp. iv—345-452, pl. 1. (Extr. Trans. Roy. Soc. Edinburgh.) Edinburgh, 1878. From the author.

Monograph of the Fossil Reptilia of the Wealden and Purbeck Formations. Supplement No. ix—Crocodylia (Goniopholis, Brachydictes, Nannosuchus, Theriosuchus and Nuthetes). By Prof. Owen, C.B., F.R.S. 4to, pp. 1-19, pls. 1-iv. (Palæontographical Society.) London, 1879. From the author.

Description of fragmentary indications of a huge kind of Theriodont Reptile (*Titanosuchus ferox* Ow.) from Beaufort, West Gough Tract, Cape of Good Hope. By Prof. Owen, C.B., F.R.S., etc. 8vo, pp. 189-199, pl. 1. (Ext. Quar. Jour. Geol. Soc., 1879.) From the author.

On the Fossils called "Granicones;" being a contribution to the Histology of the Exo-skeleton in "Reptilia." By Prof. Owen, C.B., F.R.S., F.R.M.S. 8vo, pp. 233-236, pls. 2. (Extr. from Trans. Roy. Mic. Soc., Vol. I, 1878.) From the author.

Eighth, Ninth and Tenth Annual Reports of the Geological Survey of Indiana, made during the years 1876, '77, '78. By E. T. Cox, State Geologist, assisted by Prof. John Collett and Dr. G. M. Levette. 8vo, pp. 541, with four maps. Indianapolis, 1879. From the State geologist.

Verhandlungen des Verein für naturwissenschaftliche Unterhaltung zu Hamburg, 1876. Band. III, pp. 277, pls. 3. Hamburg, 1878. From the society.

Proceedings of the Royal Geographical Society and Monthly Record of Geography, Vol. I. 8vo, Nos. 5 and 6, May and June, 1879. London. From the society.

Bulletins de la Société d'Anthropologie de Paris. Tome 1ere (111e Série). 8vo, Paris, 1878. G. Masson, editeur. From the society.

Verhandlungen der Kaiserlichen-Königlichen Zoologisch-botanischen Gesellschaft in Wien, Bd. xxviii. 8vo, pp. 694, pls. 10, for 1878. Vienna, 1879. From the society.

Parasites; a Treatise on the Entozoa of Man and Animals, including some account of the Ectozoa. By T. Spencer Cobbold, M.D., F.R.S., etc. 8vo, pp. 508. London, J. & A. Churchill, 1879. From the author.

A List of the Brazilian Echinoderms, with notes on their Distribution, etc. By Richard Rathbun, Assistant of the U. S. Fish Commission. (From the Trans. of the Connecticut Acad. of Arts and Sciences, Vol. v, 1878.) 8vo, pp. 19.

The North American Entomologist, Vol. I, No. 23. Editor, A. R. Grote. Buffalo. 8vo, pp. 8, 1 plate.

Aztlan Chiromoztor, Eine ethnologische Studie. Von Dr. Gustav Brühl. New York, 1878. 8vo, pp. 16.

The Morphology of the Vertebrate Olfactory Organ. By A. Milnes Marshall. (Reprinted from the Quarterly Journal of Microscopical Science.) 8vo, pp. 43, 2 plates.

The Canadian Entomologist, XI, No. 7, July, 1879. 8vo, pp. 4.

The Mollusca of the Fiords near Bergen, Norway. By the Rev. A. M. Norman, M. A. (Ext. from the Journal of Conchology for January, February and March, 1879.) 8vo, pp. 71.

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GENERAL NOTES.

BOTANY.

PRECOCIOUS FLOWERING OF THE CITRUS POMONA.—On December 14, 1877, I sowed, at my place at Santa Fe lake, Florida, 289 seeds of the grape-fruit (*Citrus pomona*). This tree appears to be closely related to the shaddock (*C. decumana*), but the fruit is much smaller, being only a quarter to a third larger than a large-

sized orange; the bitter rind is smooth and of a dirty pale yellow. The seeds were slow in germinating, not appearing above ground for about eight weeks. When scarcely two inches high a blossom appeared at the top of one of the little seedlings. The flower, of fair size, was perfect in every respect, even to having the rich odor similar to that of the orange blossom, and was fully expanded on April 16, 1878, or when the little tree was only about two months old. I watched anxiously for the forming of the fruit, but this seems to have been too much to expect, for the flower fell away without exhibiting any evidence of having been fertilized. This progressive individual was, in other respects, not different from its fellow seedlings, nor did it seem to be injured by its premature efforts to produce its kind.

I have already sent the NATURALIST (see Vol. XI, p. 489, August, 1877) some notes on a similar precocity in the orange (*C. aurantium*), and now add an instance of this curious feature in another species of the same genus.—*Henry Gillman, Detroit, Michigan.*

BEES GATHERING HONEY FROM THE CATALPA.—At a recent meeting of the Philadelphia Academy of Natural Sciences I called attention to the fact that there existed large patches of nectariferous glands on the under side of the leaves, in the axils of the veins, of *Catalpa bignonioides*. Up to the present time the proof that the glands in question were nectariferous, rested only on the evidence of the taste of the secreted fluid and the presence of ants of both red and black species, apparently feasting upon the nectar. Since then I have found the common honey-bee gathering the nectar from the foliar glands with as much industry as from the flowers, the latter of which at the time the observation was made having fallen, so that there was positive evidence that the glands alone attracted the bees. Furthermore, the bees were seen to introduce their tongues into the axils of the leaves where the secretion was present in a visible quantity on the gland, and lap it up as when getting the nectar from flowers. The bees engaged at this work carried no pollen at the time, and were apparently devoted to getting the honey only.

These observations place the question of the saccharine nature of the secretion beyond any doubt, and make it probable that the Catalpa is valuable as a honey plant, and deserves a place in lawns, parks and pleasure grounds, on account not only of its beauty, but also from its economic value to the bee culturist.—*John A. Ryder.*

THE FERTILIZATION OF THE WISTARIA.—In front of my study windows grows a beautiful American Wistaria; the great purple racemes hanging in the open window fill the room with their delicate perfume. During the day the blossoms are usually visited by two or three brilliant little humming-birds, and by many

flies and bees, all attracted by the color, fragrance and nectar of the flowers. I have been interested in noticing the manner in which the insects, particularly the large humble bees, aided in securing the cross-fertilization of the blossoms.

As is well known the *Wistaria* bears papilionaceous flowers, like the pea, bean, etc., the wings of which clasp the closely appressed and somewhat coherent petals forming the keel, the latter inclosing the stamens and pistils. In the newly expanded flower, which has not been visited by insects, the stamens and pistils cannot be seen without parting the petals forming the keel; we then find the stamens united throughout the greater portion of their length, and then, together with the pistil, bent upwards at nearly a right angle; the reason of this abrupt bend will be seen farther on.

When a bee alights on the blossom it clings to the petals forming the wings, and thrusts its proboscis upwards under the base of the banner where the nectar is secreted; in doing this the weight of the insect presses down the wings and keel of the blossom and forces upwards the stamens and pistils and presses their extremities with considerable force against the thorax and abdomen of the bee. In this manner the insect becomes dusted with pollen from many flowers, some of which cannot fail to find its way to the sticky stigma which is ripe to receive it. When the bee has secured the sweets that it loves, and departs, the petals usually resume their former position with the stamens and pistils concealed. It is interesting to watch the workings of this curious plan for securing cross-fertilization in the *Wistaria*, as this plant, from the structure of its blossoms, seems to offer great obstacles to its accomplishment.—*Israel C. Russell, Plainfield, N. J.*

HUMBLE BEES AND THE GERARDIA FLAVA.—Some years ago I sent a note to the *NATURALIST* stating how the humble bees perforated the corolla of *Gerardia pedicularia*. I have, within a few days, noticed that they act in the same way, to a less degree, with *Gerardia flava* when growing in quantity. I came upon an unusually fine lot of this in Providence on the 3d of August, a very hot day. The bees were numerous, and in many cases directed their flight at once to the holes made by previous visitors on the upper sides of the corollas, near the base. Some flowers, however, were approached in the usual way. It is said that this burglarious proceeding is only noticed in the case of such plants as bloom profusely. The consequence might be in time a perceptible diminution of individuals, when, owing to less competition, the insects would act in a legitimate way, that is, approaching by the open tube.—*W. W. Bailey, Providence, R. I.*

PRUNUS PUMILA.—Growing on the sand ridges by the shore of Lake Michigan, at Pine and Millers, Indiana, are very large plants of this species. Most authorities state that the stems are

from six inches to two feet high, and trailing, a description that accords very well with the character of the plant where I have seen it away from the shore of the lake. On receding from the lake the size diminishes, and one does not have to go far to find the typical form. But here, stems four or five feet long and half an inch or more in diameter, are common; some attain the length of seven feet. Two that were measured had a girth, near the ground, of four and a half inches and five and a quarter inches, respectively. This gives a diameter of 1.43 and 1.67 inches. The stems trail but little, several spreading from the same root, much as in the common juniper, but of a more erect habit. They are decumbent, ascending or sub-erect. The fruit, when ripe, is about the size and color of the Morello cherry, and but slightly ovoid in form. In remarkable contrast with this sand cherry is the necklace poplar (*Populus monilifera* Ait.), generally a good-sized tree, fruiting abundantly in the same situation at the height of from five to ten feet. The conditions that favor the growth of the cherry, dwarf the poplar, and the former has the advantage in the struggle for existence on the sand dunes of the lake shore.—*E. F. Hill, Englewood, Ill.*

BOTANICAL NEWS.—To the *New Italian Botanical Journal* for July, F. von Müller contributes an article on the systematic position of the genus *Donatia*. L. Mecchiati records certain experiments on the emission of carbonic acid from the roots of plants.—Lübken and Warming's *Danish Journal of Popular Science*, third number, contains a well-illustrated article on Schwendener's lichen theory.—In Trimen's *London Journal of Botany* for July, A. W. Bennett concludes his *Polygalæ Americanæ novæ vel parum cognitæ*. The August number reports the publication of the second part of Hemsley's *Diagnoses of new Mexican and Central American plants*, dated July, 1879; about eighty new species are described.—Coulter's *Botanical Gazette* for August, among other notes, prints one on *Salix balsamifera*, by M. S. Bebb; while J. M. Coulter contributes notes on parallel chorisis in the petals of *Campanula media*; on a 4-merous *Lilium philadelphicum*, and on two-parted cotyledons in *Eschscholtzia*.—In the *California Horticulturalist* G. Eisen tells how to treat living plants received by mail. He submerged the plants, moss and all in two pints of tepid water and one teaspoonful of pulverized camphor for one hour; then spreading a layer of wet moss on a newspaper he sprinkled the moss with two teaspoonfuls of pulverized camphor gum; on this he opened the geraniums evenly, covering them with wet moss, and on the top spread another sheet of paper. In this bed the plants should remain over night. The next morning the plants should be potted and kept out of direct sunlight for a few days. The plants should be watered very sparingly with camphor water.—The Tenth Annual Report of the Geological Survey of Indiana contains a cata-

logue and check list of the trees and woody shrubs of America, north of Mexico, by John W. Byrkit. It occupies fifteen pages of the report. Mrs. Haines also contributes a list of the ferns, mosses, hepaticæ and lichens of Wayne county, Indiana.—*Grevillea* for March and June contains an article by Dr. M. C. Cooke, strongly opposing the "dual lichen hypothesis," proposed by Schwendener.—The death of the following botanists has recently been announced: Elisabetha, Contessa Fiorini-Mazzanti, author of many papers on Algæ, etc.; of Thilo Irmisch, well known for his memoirs on the morphology of Phanerogams; of E. Spach, a voluminous author of systematic works and papers; of Prof. Karl Koch, of Berlin, best known as a horticultural botanist, as was David Moore, the well-known director of the Glasnevin Botanic Gardens, Dublin, who died June 9th at the age of seventy-two years; Tilbury Fox, M.D., who had given attention to the part played by minute fungi in producing skin and hair diseases, died at Paris, June 7th. We may add to the list Wm. Schimper, who, according to Gray, was the schoolmate of Agassiz, and one of the first investigators of phyllotaxy; he spent most of his life in Abyssinia.

ZOÖLOGY.¹

THE SPADE-FOOT TOAD IN NEW HAVEN, CONN.—For more than two years I have been looking for the "spade-foot" (*Scaphiopus holbrookii*) in and about New Haven, confident that it occurred here and that careful search would reveal it; but my efforts have been vain until very lately. Thursday, April 24th, I saw some children gathered around an object on the pavement of Prospect street, and I asked them what they had. They replied that they had dug up a toad in the next yard. You can imagine my surprise and delight to behold a real live "spade-foot," the first I had ever seen alive. They willingly gave it to me, and I carefully took it home with me and kept it alive in a large box with plenty of earth and a tub of water.

Tuesday morning (the 29th) I was shooting small birds near Fair Haven, when I heard a most peculiar bellowing from a pond near by. I am more or less familiar with all the ordinary sounds that come from a pond, and I jumped at the conclusion that I heard the "spade-foot." On reaching the pond I saw a sight I shall never forget; the pond was rather small, and was swollen and overflowing on account of the heavy rains of the two preceding days, and swimming all over the surface, and at times uttering their peculiar bellow, were forty or fifty of my long-sought friends. They would float or swim awkwardly along until they wished to favor me with a song, and then the accommodating soloist would suddenly assume a perpendicular position as if a plummet had been attached to his tail, his head alone show-

¹The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.